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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,461	12/21/2001	John A. Dispenza	129250-001049/US	5477

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EXAMINER	
LIN, KUANG Y	

ART UNIT	PAPER NUMBER
1793	

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10/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/029,461	DISPENZA ET AL.	
	Examiner	Art Unit	
	Kuang Y. Lin	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-12,14-16,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-12,14-16,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-4, 6-8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,344,477 to Miki et al. and further in view of US 5,040,589 to Bradley et al.

Miki et al. show a method of making a heat exchanger by first placing a hollow preform in a casting mold cavity, and then cast the molten metal into the mold cavity to unite the preform to form the heat exchanger. Thus, Miki et al. substantially show the invention as claimed except that they do not show to rheocast Mg alloy to unite the conductive core object. However, it is a common knowledge that Mg alloy possesses high thermal conductivity, it would have been obvious to use Mg alloy as a cast material for forming the fins of the heat

exchanger of Miki et al. Further, Bradley et al. show that it is desirable to rheocast Mg alloy, instead of die casting of molten Mg alloy, such that to reduce the energy consumption, increase the die service life, etc. (see col. 1, lines 10-51). It would have been obvious to use the semi-solid Mg alloy of Bradley et al. as a casting material in the process of making heat exchanger of Miki et al. in view of the advantage. With respect to claims 3 and 4, it would have been obvious to obtain the optimal composition and process parameters for forming the fins through routine experimentation.

4. Claims 9-12, 14-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,344,477 to Miki et al. and further in view of US 5,040,589 to Bradley et al. as applied to claim 1 above, and further in view of JP 6-292,944.

JP 6-292,944 show to continuous cast articles by using a continuous casting machine, which consists of two series of die plates, such that to speed up the casting process. It would have been obvious to place the hollow preform of Miki in the continuous casting machine of JP '944 and injecting the semi-solid Mg alloy of Bradley into the mold cavity of JP '944 for forming the heat exchanger of Miki et al. in view of the advantage. With respect to claims 11 and 12, it would have been obvious to obtain the optimal composition and process parameters for forming the fins through routine experimentation.

5. Applicant's arguments filed September 16, 2009 have been fully considered but they are not persuasive.

a. Applicant in page 7, 2nd para. of the response stated that neither Miki nor Bradley disclose the feature of "substantially simultaneously form the fins and form a contact area that provides a substantially continuous void free interface between a core object and a metal slurry" as in claim1. However, as stated in the last office action, when the semi-solid magnesium alloy of Bradley is used in the process of Miki for making the heat exchanger, it is expected to form the fins substantially simultaneously and to have a substantially void free interface between the core and the metal slurry since the semi-solid slurry of Bradley is also injected into the mold cavity of Miki to unite the core perform. Since the process of Miki, as modified, is the same process as the instant application, the result of that process would be the same as that of instant application. Further, the expressions of "**substantially** simultaneously" and "**substantially** void free" are **qualitative** expressions. Thus, the modified process of Miki is considered to be the same or substantially the same as that of the process as claimed and thereby forming the same or substantially the same product as that of instant application, i.e. to form the fins substantially simultaneously and to have a substantially void free interface between the core and the metal slurry, even if the solidification process of Miki is some what different from that of instant process. Thus, the invention as claimed does not define over the process of Mike as modified by Bradley.

b. Applicant in the junction para. between pages 8 and 9 of the response stated that one skilled in the art would not have combined the teachings of Miki

and Bradley because the thixotropic slurry of Bradley has a higher viscosity than the molten metal of Miki. However, it is a common practice that either molten metal or semi-solid may be injected into the mold cavity to unite the preform and form a cast article (see, for example, col. 6, lines 23-30 of US 5,433,511 to Wei). Since Bradley et al. show that it is desirable to rheocast Mg alloy, instead of die casting of molten Mg alloy, such that to reduce the energy consumption, increase the die service life, etc. (see col. 1, lines 10-51), it would have been obvious to use the semi-solid Mg alloy of Bradley et al. as a casting material in the process of making heat exchanger of Miki et al. in view of the advantage.

c. Further, it is known in the casting art and as evident by US 6,151,198 to Prater et al. (see col. 1, lines 11-44) that several potential benefits that could result from forming processes utilizing semi-solid metal and that would differentiate these processes from conventional casting. First, and particularly significant for higher melting alloys, semi-solid metalworking afforded lower operating temperatures and reduced metal heat content (reduced enthalpy of fusion). Second, the viscous flow behavior could provide for a more laminar cavity fill than could generally be achieved with liquid alloys. This could lead to reduced gas entrainment. Third, solidification shrinkage would be reduced in direct proportion to the fraction solidified within the semi-solid alloy, which should reduce both shrinkage porosity and the tendency toward hot tearing. Those benefits would further motivate those of ordinary skilled in the casting art to use

the semi-solid Mg alloy of Bradley et al. as a casting material in the process of making heat exchanger of Miki et al.

d. Applicant in page 12, 3rd para. of the response stated that the examiner does not articulate how Miki and Bradley are being applied to the claims. As explain in the rejection supra, JP 6-292,944 show to continuous cast articles by using a use a continuous casting machine, which consists of two series of die plates, such that to speed up the casting process. It would have been obvious to place the hollow preform of Miki in the mold cavity of the continuous casting machine of JP '944 and injecting the semi-solid Mg alloy of Bradley into the mold cavity of JP '944 for forming the heat exchanger of Miki et al. to speed up the casting process.

e. Applicant in page 13, last para. through page 14, 1st para. of the response stated that since there is no translation for JP '944 reference, it is not possible for the applicants to determine whether the combination of the JP '944, Miki and Bradley is permissible and whether the pressure or temperature discussed in JP '944 are suitable to be used at the pressure and temperature discussed in Miki and Bradley. The examiner's response: JP '944 is cited simply to show that it is conventional to use a caterpillar type continuous casting machine for continuous casting metallic article, in lieu of conventional batch-wise casting process, to speed up the output. Since the casting mold is made of copper or copper alloy of high thermal conductivity material, those molding material is capable of sustaining high temperature and high pressure process conditions. Thus, there

would not be any problem for casting low melting point materials, such as magnesium of Bradley.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuang Y. Lin whose telephone number is 571-272-1179. The examiner can normally be reached on Monday-Friday, 10:00-6:30,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kuang Y. Lin/
Primary Examiner, Art Unit 1793

10-8-09